National Institute of Environmental Health Sciences

Ancillary human health benefits of improved air quality resulting from climate change mitigation

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Abstract:

BACKGROUND: Greenhouse gas (GHG) mitigation policies can provide ancillary benefits in terms of short-term improvements in air quality and associated health benefits. Several studies have analyzed the ancillary impacts of GHG policies for a variety of locations, pollutants, and policies. In this paper we review the existing evidence on ancillary health benefits relating to air pollution from various GHG strategies and provide a framework for such analysis. METHODS: We evaluate techniques used in different stages of such research for estimation of: (1) changes in air pollutant concentrations; (2) avoided adverse health endpoints; and (3) economic valuation of health consequences. The limitations and merits of various methods are examined. Finally, we conclude with recommendations for ancillary benefits analysis and related research gaps in the relevant disciplines. RESULTS: We found that to date most assessments have focused their analysis more heavily on one aspect of the framework (e.g., economic analysis). While a wide range of methods was applied to various policies and regions, results from multiple studies provide strong evidence that the short-term public health and economic benefits of ancillary benefits related to GHG mitigation strategies are substantial. Further, results of these analyses are likely to be underestimates because there are a number of important unquantified health and economic endpoints. CONCLUSION: Remaining challenges include integrating the understanding of the relative toxicity of particulate matter by components or sources, developing better estimates of public health and environmental impacts on selected sub-populations, and devising new methods for evaluating heretofore unquantified and non-monetized benefits.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2519068

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature

Air Pollution: Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): NOx

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Global or Unspecified

Health Co-Benefit/Co–Harm (Adaption/Mitigation): ☑

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

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Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cancer, Cardiovascular Effect, Injury, Morbidity/Mortality, Respiratory Effect, Other Health Impact

Respiratory Effect: Asthma, Bronchitis/Pneumonia, Other Respiratory Effect

Respiratory Condition (other) : Chronic bronchitis

Other Health Impact: Emergency room visits; Hospital admissions; Eye irritation

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Mitigation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Cost/Economic, Exposure Change Prediction, Methodology

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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